IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A wave-front aberration measuring method with which to measure [~~a~~] wave-front aberration ~~in~~ of an optical system ~~subject to measurement~~, said measuring method comprising:

measuring~~, first,~~ aberration components of a first set of ~~order terms~~ orders out of a plurality of aberration components ~~of order terms of a predetermined basis in which the wave-front aberration in said optical system is expanded~~ obtained by expanding the wave-front aberration of said optical system using a predetermined basis;

calculating correction information for aberration components of a second set of ~~order terms~~ orders, based on ~~a predetermined order term's~~ aberration ~~component~~ components of predetermined orders out of the measured aberration components of said first set of ~~order terms~~ orders;

measuring aberration components of said second set of ~~order terms in~~ orders of said optical system; and

correcting the result of said measuring of aberration components of said second set of ~~order terms~~ orders based on said correction information.

2. (Currently Amended) A wave-front aberration measuring method according to claim 1, wherein

~~the expansion in said predetermined basis is an expansion in a set of~~ the plurality of aberration components is obtained by expanding the wave-front aberration of said optical system using fringe Zernike polynomials.

3. (Currently Amended) A wave-front aberration measuring method according to claim 1, wherein

said first set of ~~order terms include~~ orders includes all of a lowest order ~~term~~ through a first ordinal order ~~term~~ in said expansion, and

~~wherein~~ said second set of ~~order terms include~~ orders includes all of said lowest order ~~term~~ through a second ordinal order ~~term~~ in said expansion, said second ordinal being lower than said first ordinal.

4. (Currently Amended) A wave-front aberration measuring method according to claim 3, wherein

said predetermined ~~order term is~~ orders are included in said first set of ~~order terms~~ orders and not included in said second set of ~~order terms~~ orders,

~~wherein~~ calculating said correction information comprises:

calculating a first wave-front in which aberration components of other orders than said predetermined orders out of said measured first set of orders are zero ~~with letting aberration components of other order terms of said first set of order terms measured than said predetermined order term be zero~~; and

calculating as said correction information respective correction amounts for aberration components of said second set of ~~order terms~~ orders, based on a model for a measuring system that measures aberration components of said second set of ~~order terms~~ orders and on said first wave-front, and

~~wherein~~ in correcting based on said correction information, the measured aberration components of said second set of ~~order terms measured~~ orders are individually corrected

~~based on said correction information~~.

5. (Currently Amended) A wave-front aberration measuring method according to claim 3, wherein

said predetermined ~~order term is~~ orders are included in said first set of ~~order terms~~ orders and not included in said second set of ~~order terms~~ orders,

~~wherein~~ calculating said correction information comprises calculating as said correction information a first wave-front in which aberration components of other orders than said predetermined orders out of said measured first set of orders are zero ~~with letting aberration components of other order terms of said first set of order terms measured than said predetermined order term be zero~~, and

~~wherein~~ correcting based on said correction information comprises:

calculating a second wave-front that has aberration components of said second set of ~~order terms~~ orders measured by a measuring system that measures aberration components of said second set of ~~order terms~~ orders;

calculating a third wave-front by correcting said second wave-front based on said first wave-front; and

calculating corrected aberration components of said second set of ~~order terms~~ orders, based on said third wave-front and a model for said measuring system.

6. (Currently Amended) A wave-front aberration measuring method according to claim 1, wherein

measuring aberration components of said second set of ~~order terms~~ orders comprises:

forming a plurality of pattern images by dividing ~~by use of a predetermined optical~~

~~system a~~ wave-front of light having passed through said optical system using a predetermined optical system; and

calculating aberration components of said second set of ~~order terms~~ orders, based on positions of said plurality of pattern images ~~formed~~.

7. (Currently Amended) A wave-front aberration measuring method according to claim 1, wherein

measuring aberration components of said second set of ~~order terms~~ orders comprises:

~~imaging, after~~ placing ~~at the object plane of said optical system~~ a plurality of divided pattern areas on which a plurality of patterns are formed, at the object plane of said optical system, said patterns producing ~~on each of which a pattern that produces~~ light passing through ~~a~~ respective ~~area~~ areas of a plurality of areas on the pupil plane of said optical system ~~is formed~~,

~~said patterns formed on~~ imaging images of said plurality of patterns respectively formed on said plurality of divided pattern areas through said optical system; and

calculating aberration components of said second set of ~~order terms~~ orders, based on positions of images of said ~~pattern, formed~~ plurality of patterns imaged by said optical system.

8. (Currently Amended) A wave-front aberration measuring ~~unit~~ apparatus which measures ~~a~~ wave-front aberration ~~in~~ of an optical system ~~subject to measurement~~, said measuring ~~unit~~ apparatus comprising:

a storage unit that stores ~~calculated~~ correction information for aberration components of a second set of ~~order terms~~ orders, said correction information being calculated based on ~~a~~

~~predetermined order term's~~ aberration ~~component~~ components of predetermined orders out of aberration components of a first set of ~~order terms measured before~~ orders out of a plurality of aberration components obtained by expanding ~~of order terms of a predetermined basis in which~~ the wave-front aberration ~~in~~ of said optical system ~~is expanded~~ using a predetermined basis;

a measuring system that measures aberration components of said second set of ~~order terms~~ orders of the wave-front aberration ~~in~~ of said optical system; and

a correcting unit coupled to said storage unit and said measuring system, which ~~that~~ corrects the measuring result of said measuring system ~~with~~ using said correction information.

9. (Currently Amended): A wave-front aberration measuring ~~unit~~ apparatus according to claim 8, wherein

~~the expansion in said predetermined basis is an expansion in a set of~~ the plurality of aberration components is obtained by expanding the wave-front aberration of said optical system using fringe Zernike polynomials.

10. (Currently Amended) A wave-front aberration measuring ~~unit~~ apparatus according to claim 8, wherein

said measuring system comprises:

a wave-front dividing device ~~that divides a~~ positioned to divide wave-front of light having passed through said optical system to form images of a plurality of patterns ~~pattern images~~; and

an aberration-component calculating unit coupled to said correcting unit, which ~~that~~

calculates aberration components of said second set of ~~order terms,~~ orders, based on positions of the images of said plurality of ~~pattern images formed~~ patterns.

11. (Currently Amended) A wave-front aberration measuring ~~unit~~ apparatus according to claim 10, wherein

said wave-front dividing device is a micro-lens array where lens elements are arranged in a matrix.

12. (Currently Amended) A wave-front aberration measuring ~~unit~~ apparatus according to claim 8, wherein

said measuring system comprises:

a pattern-formed member that is placed on the object plane's side of said optical system and has a plurality of divided pattern areas on ~~each of~~ which ~~a pattern that produces~~ a plurality of patterns are formed, said patterns producing light passing through ~~a~~ respective ~~area~~ areas of a plurality of areas on the pupil plane of said optical system ~~is formed~~; and

an aberration-component calculating unit coupled to said correcting unit, which ~~that~~ calculates aberration components of said second set of ~~order terms,~~ orders, based on positions of images of said ~~pattern, formed by said optical system~~ plurality of patterns.

13. (Currently Amended) An exposure apparatus which transfers a ~~given~~ pattern onto a substrate ~~by illuminating said substrate with exposure light~~, said apparatus comprising:

an exposure apparatus main body that comprises a projection optical system arranged on the optical path of ~~said~~ exposure light; and

a wave-front aberration measuring ~~unit~~ apparatus according to claim 8 with said projection optical system as an optical system ~~subject to measurement~~.

14. (Original) A device manufacturing method including a lithography process, wherein

in the lithography process, an exposure apparatus according to claim 13 performs exposure.

15. (Original) A device manufactured according to the device manufacturing method of claim 14.

16. (New) A wave-front aberration measuring method with which to measure wave-front aberration of a projection optical system that projects a pattern onto a substrate, said measuring method comprising:

measuring aberration components of a second set of orders out of aberration components of a first set of orders included in wave-front aberration of said projection optical system; and

correcting said measured aberration components of said second set of orders, based on predetermined orders that are included in aberration components of said first set of orders and not included in aberration components of said second set of orders.

17. (New) A wave-front aberration measuring method according to claim 16, wherein

aberration components of said first set of orders are measured before measuring aberration components of said second set of orders.

18. (New) A wave-front aberration measuring method according to claim 17, wherein

aberration components of said first set of orders are measured before said projection

optical system is installed in an exposure apparatus main body.

19. (New) A wave-front aberration measuring method according to claim 18, wherein

aberration components of said first set of orders are obtained by expanding the wave-front aberration of said projection optical system using a predetermined basis.

20 (New) A wave-front aberration measuring method according to claim 19, wherein

aberration components of said first set of orders are obtained by expanding the wave-front aberration of said projection optical system using fringe Zernike polynomials.

21. (New) A wave-front aberration measuring method according to claim 18, wherein

aberration components of said second set of orders are measured by a measuring system different from the measurement of aberration components of said first set of orders.

22. (New) A wave-front aberration measuring method according to claim 21, wherein

said measuring system measuring aberration components of said second set of orders is based on the Shack-Hartmann technique.

23. (New) A wave-front aberration measuring method according to claim 21, wherein

said measuring system has a micro-lens array that divides wave-front of light having passed through said projection optical system, and

aberration components of said second set of orders are calculated based on positions of a plurality of pattern images formed by said micro-lens array.

24. (New) A wave-front aberration measuring apparatus which measures wave-front aberration of a projection optical system that projects a pattern onto a substrate, said measuring apparatus comprising:

a measuring system arranged in said projection optical system, which measures aberration components of a second set of orders out of aberration components of a first set of orders included in wave-front aberration of said projection optical system; and

a correcting unit coupled to said measuring system, which corrects said measured aberration components of second set of orders, based on predetermined orders that are included in aberration components of said first set of orders and not included in aberration components of said second set of orders.

25. (New) A wave-front aberration measuring apparatus according to claim 24, wherein

aberration components of said first set of orders are measured before said projection optical system is installed in an exposure apparatus main body.

26. (New) A wave-front aberration measuring apparatus according to claim 24, wherein

aberration components of said first set of orders are obtained by expanding the wave-front aberration of said projection optical system using a predetermined basis.

27. (New) A wave-front aberration measuring apparatus according to claim 26, wherein

aberration components of said first set of orders are obtained by expanding the wave-front aberration of said projection optical system using fringe Zernike polynomials.

28. (New) A wave-front aberration measuring apparatus according to claim 24, wherein

aberration components of said second set of orders is measured by a measuring system different from the measurement of aberration components of said first set of orders.

29. (New) A wave-front aberration measuring apparatus according to claim 28, wherein

the measuring system measuring aberration components of said second set of orders is based on the Shack-Hartmann technique.

30. (New) A wave-front aberration measuring apparatus according to claim 29, wherein

said measuring system has a micro-lens array that divides wave-front of light having passed through said projection optical system.

31. (New) An exposure apparatus which transfers a predetermined pattern onto a substrate using a projection optical system, said apparatus comprising:

an adjusting unit coupled to the wave-front aberration measuring apparatus of claim 24, which adjusts the imaging characteristic of said projection optical system, based on the measuring result of said wave-front aberration measuring apparatus.